

## **Abstract**

The invention discloses a space-time encoding and decoding method for a frequency selective fading channel, comprising: an encoder taking two independent data fields of a time slot in input data as a processing unit with space-time orthogonal encoding method, encoding them and generating two data vectors, thereby forming two diversity signals, and transmitting said two diversity signals simultaneously with each through one diversity antenna; a receiving terminal neglecting mutual interference between said two diversity signals caused by non-orthogonality; the terminal performing joint detection only taking into account affect to said two diversity signals from multipath interference and multi-user interference, thereby obtaining a decoding result; and implementing interference counteraction based on result of joint diction to remove interference between two diversity signals, and then returning to the previous step to implement iteration for decoding processing. The number of iteration times can be predefined. The invention takes an independent data field as a processing unit for encoding and decoding, and the decoding takes an iteration method based on joint detection and interference counteraction. This invention provides a simple and effective way for space-time encoding and decoding for a frequency selective fading channel.